Foreword

The Kentucky Department for Public Health (KDPH) is pleased to release this report on the status of cardiovascular health in Kentucky. The report describes the burden of cardiovascular disease in Kentucky, including statistics for individual counties regarding mortality, hospitalizations, and risk factors. This report will be the first of a series analyzing data related to cardiovascular health in Kentucky. Its preparation is part of an effort to strengthen the scientific capacity in the state health department to plan, implement, and evaluate new and existing cardiovascular health initiatives across the state.

Work to prepare this report was supported by a grant from the Centers for Disease Control and Prevention under a new national cardiovascular health program. Kentucky was one of the first eight states in the country to receive funding under this program in the fall of 1998, and was especially fortunate to receive additional funds under this grant to begin a major initiative in our schools in conjunction with the Kentucky Department of Education. Kentucky was the only state in the country to receive funding for a school health component.

These federal grants, called capacity building grants, were awarded on a competitive basis to state health departments to provide assistance in building statewide cardiovascular health programs. A variety of activities and initiatives have been or will be undertaken under the grant including hiring of program staff in KDPH including an epidemiologist who was critical in preparing this document.

One of the primary requirements of the CDC grant is the development of a state cardiovascular health plan. Release of this report coincides with the formation of a new state cardiovascular health coalition consisting of a diverse group of partners from both the public and private sectors which will be charged with developing this cardiovascular health plan. We hope that this report will provide the coalition members and other interested constituencies with a basic understanding of the severity of the problem facing Kentucky as we more forward to develop a cardiovascular health plan for the state.

The state cardiovascular health plan will focus on strategies for bringing about policy and environmental changes across the state that will improve the eating patterns and physical activity levels of all Kentuckians and reduce the smoking rates. It will also recommend strategies that can be implemented in our communities, schools, worksites and the health care system. Finally, the plan will serve as the basis for requesting additional funding in the future to be used in local initiatives aimed at making these important policy and environmental changes.

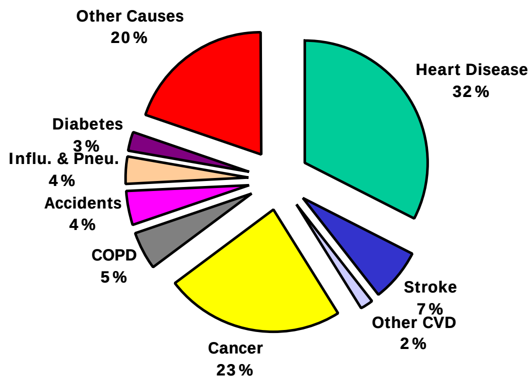
Overview of Cardiovascular Disease In Kentucky

Historically, cardiovascular disease, particularly heart attack, was considered a disease of privilege and was more prevalent in cities than in rural areas. This is no longer the case. The data shown in this report reveals that death and illness due to cardiovascular disease is rampant in both the urban and rural areas of Kentucky.

The first half of the 20th century brought innovations in food production, processing and distribution which resulted in the entire population having access to more meat, dairy products and high fat foods. Changes in the transportation system, occupational structure and the transition from agricultural jobs to sedentary manufacturing and service sector employment are directly related to decreased physical activity. Overall improvements in the standard of living resulted in easier access to tobacco and high fat foods for the poor and working class.

These changes have contributed to making Cardiovascular Disease (CVD), including heart disease and stroke, the leading cause of death in every county in Kentucky. During the next year, cardiovascular disease, primarily heart disease and stroke will kill more than 15,000 Kentuckians. Whether male or female, black or white, CVD will kill more people in Kentucky this year than all forms of cancer, pneumonia and influenza, and traffic accidents combined.

Figure 1- Leading Causes of Death in Kentucky



TERMS

Cardiovascular Disease (CVD):
A group of diseases of the heart and blood vessels, including coronary heart disease (CHD), the disease that leads to a heart attack, and diseases of the blood vessels that lead to a stroke or brain attack.

Mortality Rate (or Death Rate):
A measure of deaths due to a particular cause which occur in a given population during a specified time period, usually one year. This document reports rates per 100,00.

Age Adjusted Death Rate:
An age-adjusted death rate allows comparison of death rates from different time periods, or places with different age structures. Age adjusting takes away the effect of our "aging" population, and gives us a number that reflects changes to factors other than age.

Arteriosclerosis: Commonly called hardening of the arteries. This includes a variety of conditions that cause artery walls to thicken and lose elasticity.

Atherosclerosis: Thickening of the inner layers of artery walls due to deposits of fat, cholesterol and other substances. This can block the blood supply to the heart or brain causing a heart attack or stroke.

During 1997, 40% of all hospitalizations in Kentucky were due to cardiovascular disease. Hospital charges for CVD totaled over $863 **million** or 46% of the all hospitalization charges. While medical advances have resulted in more people surviving heart attack and stroke, more and more people are experiencing disability due to the complications of CVD. The American Heart Association identifies coronary heart disease as the leading cause of premature, permanent disability, accounting for 19% of all disability allowances paid by Social Security. Cerebrovascular disease (Stroke) has been shown to have the greatest impact on disability with 31% of survivors needing help caring for themselves, 20% needing help walking and 71% experiencing impaired vocational capacity 7 years after the stroke.

Illness and death from CVD are related to a number of preventable and modifiable risk factors such as physical inactivity, obesity, smoking, diabetes, high blood cholesterol and high blood pressure. The burden of death and disability from CVD in Kentucky can be reduced by communities, schools and employers working together to promote healthier lifestyles.

Trends in Cardiovascular Disease in Kentucky

The American Heart Association "2000 Heart and Stroke Statistical Update", ranks Kentucky 5th in age-adjusted CVD mortality rate. Only 4 states, Louisiana, West Virginia, Tennessee and Mississippi have higher rates of Mortality from CVD. Seventy-three of Kentucky's 120 counties have CVD mortality rates above the national average of 386 deaths per 100,000 people. Twenty counties have CVD mortality rates that are more than 25% higher than the national average.

Nationwide and in Kentucky, death rates from CVD have declined significantly over the past two decades. However, focusing on 1990 thru 1997, we see that this decline has slowed, and in some age groups actually increases.

Figure 2
Age-Adjusted CVD Mortality Rates: Kentucky 1980, 1985 1990-1997

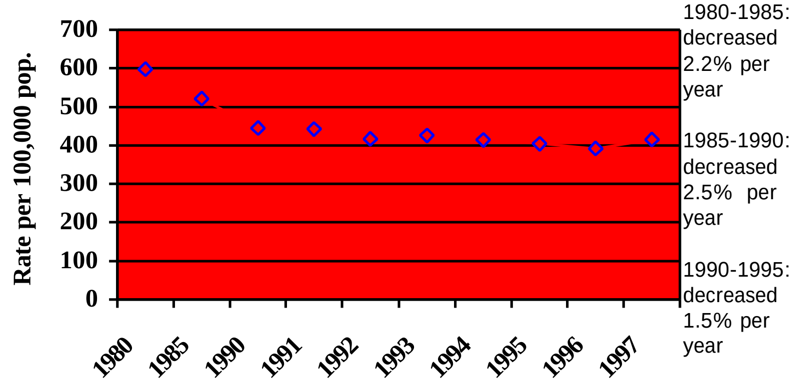
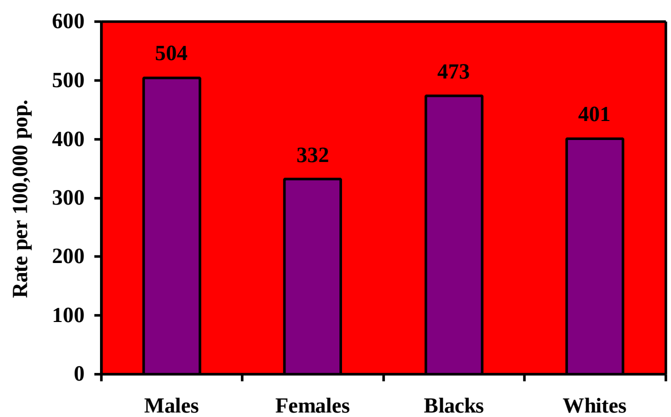


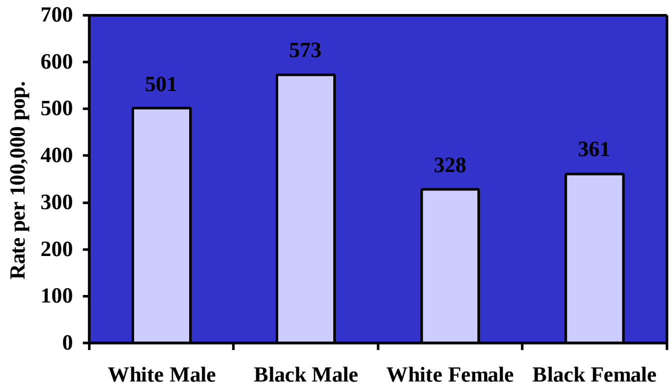
Figure 3
Race and Gender Differences in Age Adjusted CVD Mortality Rates: Kentucky 1995-1997



From 1980 to 1985, CVD mortality declined by 2.2% per year, and declined 2.5% per year between 1985 and 1990. In contrast, from 1990 to 1997, CVD mortality declined only 1.5% per year.

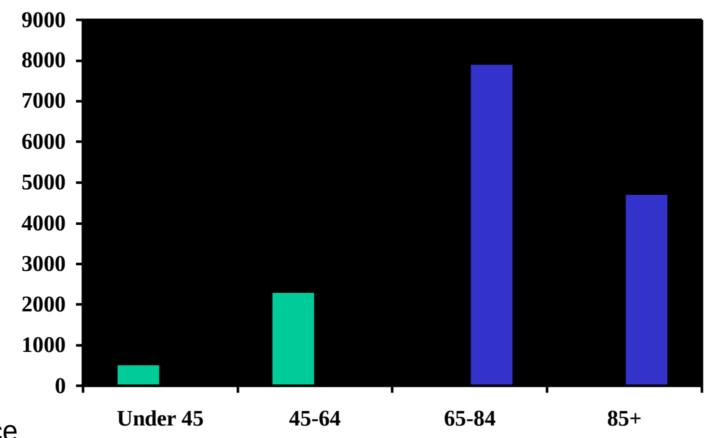
CVD mortality rates differ by race and sex. Men have higher rates than women and blacks have higher rates than whites. In Kentucky, the CVD mortality rate for men is 34% higher for men than for women, and for blacks is 15% higher than whites.

Figure 4
Race/Sex Differences in CVD Mortality
Kentucky 1995-1997



Another way to measure group differences in CVD death is to look at "premature death", or death occurring prior to age 65. Figure 3 shows that 1 in 6 Deaths due to CVD in Kentucky during 1997 occurred in people under age 65.

Figure 5
CVD Deaths in Kentucky by Age: 1995-1997



Closer examination of those premature deaths show clear racial differences. Table 1 shows clear disparities in premature death for black men and black women. Black men have 50% more premature death compared to white men, while black women experience almost twice the level of premature death as white women.

Table 1- Race and Sex Differences in Premature CVD Deaths in Kentucky, 1997

Percent of CVD Deaths Before age 65 Years	
Black Males	36%
White Males	24%
Black Females	19%
White Females	10%

Such racial differences are common nationwide and have been recognized for many years. These differences are typically attributed to higher prevalence of risk factors and decreased access to health care.

One of the most common, and damaging, myths around CVD is that "heart disease is a man's disease". While men have a higher risk of dying from CVD than women, in terms of absolute numbers, more women die from CVD each year than do men. In 1997, 8,189 Kentucky women died from CVD compared to 7,414 Kentucky men. Women comprise 53%

of all deaths due to CVD statewide, and in several Kentucky counties, more than 60% of all CVD deaths are among women. This is in line with the national trend, which shows that the gap between the number CVD deaths among men and women is in fact ***widening***.

The reason that the rate of CVD deaths for women is lower than for men is that women die of CVD later in life than do men. As women approach menopause, decreases in estrogen levels result in women losing one protective edge against heart disease. After menopause, women risk of heart disease and stroke increase steadily with age.

Individual County CVD Mortality Rates

For Kentucky and each county, Appendix A shows data on the number of CVD deaths, CVD mortaltiy rate, % of all deaths due to CVD, % of CVD deaths among women and number of men and women whose deaths are attributed to CVD during 1995-1997. Map 1 illustrates just how widespread the CVD problem is in Kentucky, and the extent to which the problem is worse in non-metropolitan areas.

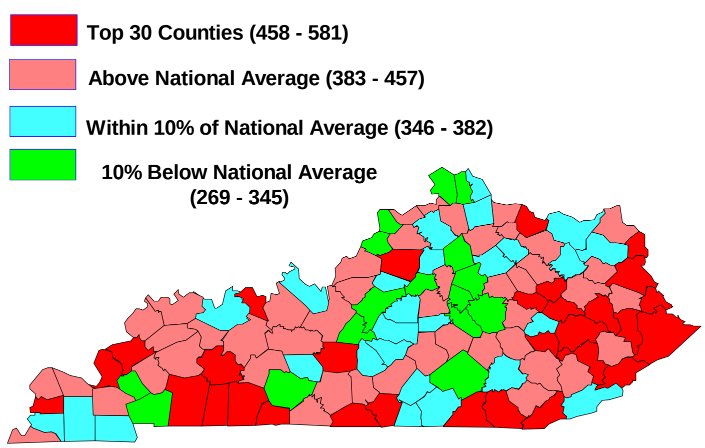
Appendix B contains maps showing age adjusted CVD Mortality rates for All Men, All Women, All Blacks and All Whites. A brief examination of any of these maps show that CVD is a significant problem in all areas of the state and for all groups. CVD is truly a population wide challenge for public health in Kentucky.

Table 2

Kentucky Counties:
10 Highest CVD Mortality Rates

All		Women		Men	
Simpson	(581)	Hancock	(489)	Simpson	(717)
Wolfe	(542)	Simpson	(487)	Lawrence	(692)
Martin	(540)	Wolfe	(481)	Breathitt	(688)
Todd	(534)	Menifee	(479)	Webster	(664)
Hancock	(519)	Martin	(469)	Cumberland	(652)
Mason	(514)	Livingston	(463)	Logan	(652)
McCreary	(506)	Hart	(452)	McCreary	(648)
Lawrence	(504)	Mason	(439)	Fulton	(646)
Logan	(504)	Boyd	(438)	Martin	(645)
Owsley	(503)	Bell	(436)	Todd	(642)

Map 1
CVD Mortality Rate
Kentucky 1995-1997



***Age-adjusted to the 2000 U.S. Standard Population**
Source: Kentucky Department for Public Health

Hospitalizations for Cardiovascular Disease

Many more Kentuckians experience serious health consequences from CVD than reflected in the 15,424 deaths in 1997. In 1997, there were 65,062 hospitalizations for heart attack, stroke or other CVD in Kentucky. Those experiencing CVD hospitalizations spent a total of 352,795 days as inpatients in Kentucky hospitals. The majority of those who survive such health crises find their lives forever changed. Many will need medications for the rest of their lives, and others will incur severe, permanent disabilities affecting the ability to speak, walk or move their arms or legs. Many will not be able to return to their former jobs.

Hospitalization due to CVD imposes a serious economic burden on the Commonwealth. Forty percent of all inpatient hospitalizations in Kentucky in 1997 carried CVD as a primary diagnosis, and those cases accounted for 46% of the total charges billed ($863,197,161 of $1,879,606,288 total charges billed). After hospitalization, further costs are incurred for long-term care, rehabilitation services and lost productivity.

Table 3
CVD Hospitalizations in Kentucky: 1997

Total Hospitalizations	**65,062**
Males	**32,172**
Females	**32,890**
Under 44	**4,473**
45-64	**19,798**
65-74	**17,815**
75+	**22,970**
Total Charges	**$863,197,161**
Total Days	**352,795**

County level hospitalization data is presented in Appendix C. It is important to understand that this table categorizes patients by county of residence, NOT county of hospitalization. Of the 120 Kentucky counties, only 7 show CVD related charges of less than 1 million dollars for 1997. Charges in 20 counties exceed 10 million dollars. Jefferson county has the highest total with 200 million dollars in charges.

Risk Factors for Cardiovascular Disease

Risk factors are characteristics or attributes that increase a person's chance's (or risks) of developing or dying from cardiovascular disease. A number of risk factors have been scientifically linked to the development of cardiovascular disease. Among these risk factors, some are "fixed" or not subject to modification. However, many are modifiable, meaning that an individual can make changes in their lifestyle to control these risk factors, thereby slowing or even reversing the process of arterial blockage responsible for causing heart attack and stroke. One risk factor, Diabetes, is considered partially modifiable because it can often be controlled or moderated through behavioral changes.

Table 4
CVD Risk Factors

Fixed	Modifiable
Family History	Sedentary Lifestyle
	Obesity/ Overweight
Age	Tobacco Use
Gender	High Blood Pressure
	High Cholesterol
Diabetes	Diabetes

Obesity

Thirty seven percent of Kentucky adults are seriously overweight. Higher percentages of Blacks and Women are obese, and obesity increases with age. Obesity increases the chance of having additional risk factors including high blood pressure, elevated cholesterol levels and diabetes.

Physical Inactivity

Thirty-eight percent of Kentucky adults report that they are physically inactive. Reports of physical inactivity are equal for white and blacks, while more women (39%) than men (36%) are inactive. Physical inactivity also increases with age.

Inadequate physical activity is a primary contributing factor to preventable death in America. Engaging in regular physical activity reduces the risk of development of, and death due to, CVD by improving blood cholesterol and blood pressure levels, lowering body weight and improving diabetes management. Current CDC guidelines call for moderate physical activity such as brisk walking, dancing, gardening or yard work for a total of 30 minutes a day on five or more days a week. This level of physical activity has been shown to significantly reduce heart disease risk.

Figure 6:
Risk Factors Among Kentucky Adults
1995-1997

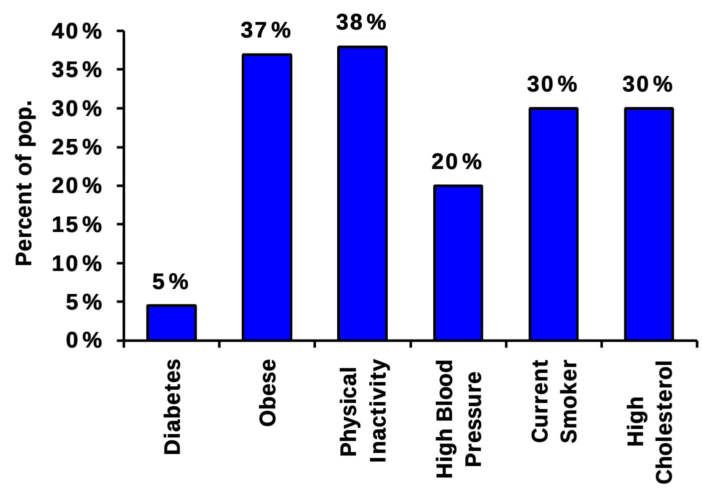
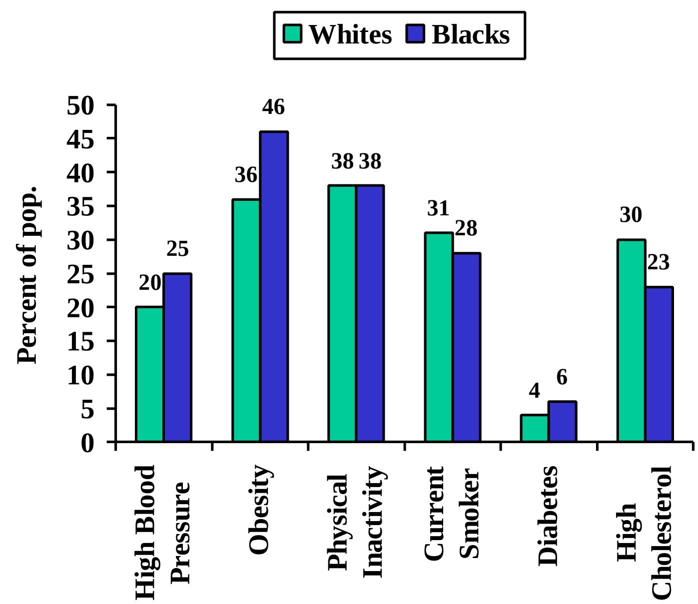


Figure 7: Risk Factors by Race 1995-1997

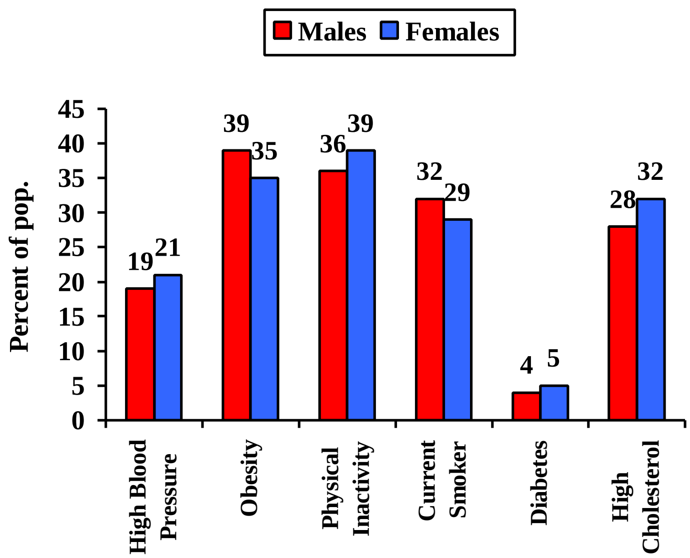


Smoking

Kentucky has one of the highest rates of tobacco use, with 30% of the adult population reporting that they currently smoke. Women (29%) and blacks (28%) smoke somewhat less than do men (32%) or whites (31%). Smoking peaks among 35-44 year olds, and then decreases with age.

Smoking has been identified as a primary public health problem for many years, and lowering smoking rates is a public health priority. In addition to the well known association between tobacco use and cancer, smoking is also known to be a major CVD risk factor. By quitting smoking, within 5 years a persons chances for having a heart attack are reduced 30 to 50 percent.

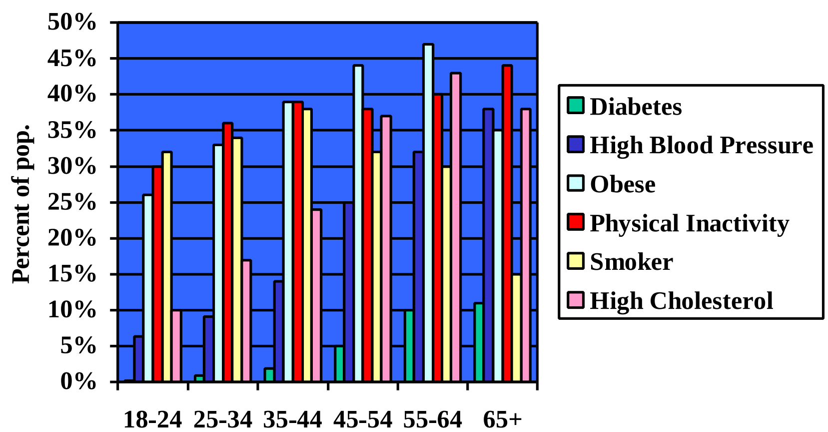
Figure 8: Risk Factors by Gender



High Blood Pressure

High blood pressure is a primary risk factor for CVD, producing a three fold increased risk of heart attack and a seven fold increased risk of stroke. 1 in 5 Kentuckians (20%) report that a health care professional has told them they have high blood pressure. Rates are slightly higher for women and blacks, and increase dramatically with age. Blood pressure can be controlled by losing weight, engaging in

Figure 9 Risk factors by Age Groups



regular physical activity, decreasing alcohol consumption, or finally, thru medication.

High blood pressure is more common as people age and is also associated with low socioeconomic status. More middle aged men than women have high blood pressure, but among older people more women exhibit high blood pressure. There may also be genetic factors related to having high blood pressure in certain families and among African-Americans.

High Blood Cholesterol

The accumulation of cholesterol on artery walls causes restricted blood flow and increases the likelihood of heart attack. Cholesterol levels can be reduced by decreasing the amount of saturated (animal) fat in the diet.

Thirty percent of Kentucky Adults have been told that they have high cholesterol levels. Elevated cholesterol levels is one of the strongest risk factors for CVD. Higher percentages of women report elevated cholesterol (32%) than do men (28%), and cholesterol levels increase with age. In Kentucky, fewer Blacks (23%) than whites (30%) report elevated cholesterol levels. This is counter to national trends, and may be due to decreased access to medial services among blacks.

Diabetes

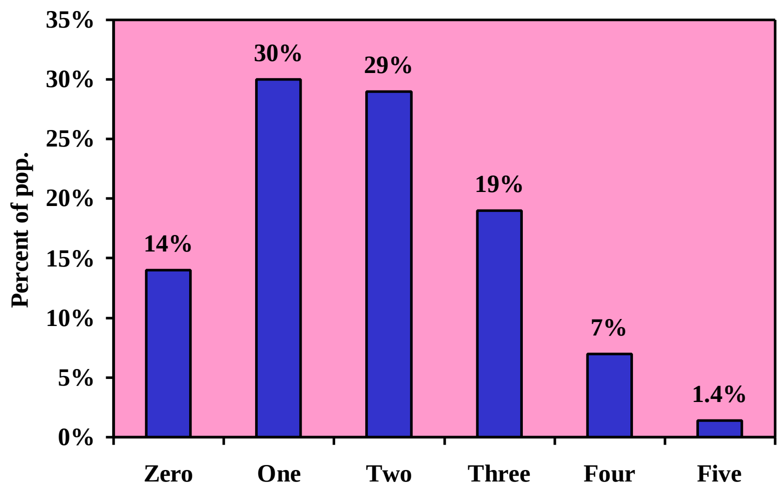
Five percent of Kentuckians report that they have Diabetes. Reported diabetes is very similar between men and women, while more blacks (6.1%) than whites (4.4%) are diabetic. Reports of diabetes increase significantly with age.

Diabetes is both a disease and a risk factor for CVD. It was the 6th leading cause of death in Kentucky in 1997. For people with Diabetes, controlling the disease, whether thru behavioral changes or medication is extremely important in reducing the chance of death due to CVD. The risk of death from CVD is 2 to 4 time higher in persons with Diabetes as compared to those without diabetes.
Nationwide, approximately 55% of people with Diabetes die from CVD and 10% die of stroke.

Multiple Risk Factors

It is very common for any one individual to have multiple risk factors for CVD. This is because risk factors tend to be strongly related to one another, or even cause other risk factors to develop. For example, a person who smokes may also have High Blood Pressure.
Among Kentucky residents from 1995 -1997, <u>only 14%</u>

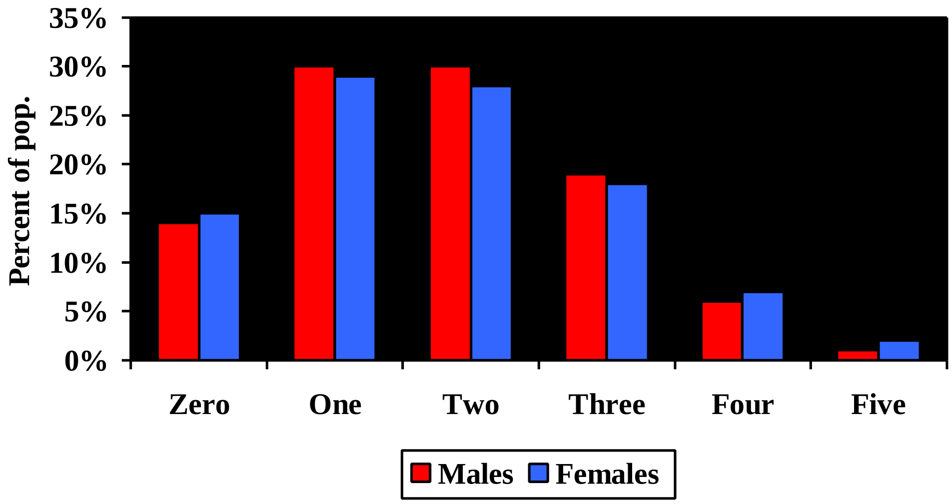
Figure 10:
Risk Factor Clustering:
Kentucky Adults 1995-1997



had NO risk factors for cardiovascular disease. A full 56% of Kentuckians have two or more risk factors, and 27% have three or more risk factors.

Figure 11 shows risk factor clustering by Gender. Fifty six percent of men and 55 percent of women have more than one risk factor for CVD

Figure 11:
Risk Factor Clustering by Gender



Appendix D shows risk factor clustering by ADD district. In each ADD, more than 50% of the population reports multiple risk factors. In five ADD's, Big Sandy (69%), Pennyrile (65%), Green River (63%) , Kentucky River (62%) and FIVCO (61%), more than 60% of the population report multiple risk factors.

Youth at Risk

As reported above, almost half of Kentucky adults currently have multiple risk factors for cardiovascular disease, but what of Kentucky's children? The habits that result in poor dietary choices, physical inactivity and tobacco use among adults are most often established in childhood. Because changing long standing, ingrained habits is very difficult, the best course of action is to insure that healthy habits are established at an early age. If the current patterns of unhealthy behavior among Kentucky youth continues, in the coming years we will see an adult population with increased risk factors at earlier ages, and subsequent increases in CVD mortality.

One of the best sources of data on youth health behaviors is the Youth Risk Behavior Survey (YBRS), sponsored by the CDC. The results of the 1997 survey of 1,465 Kentucky students in grades 9 through 12 show that our youth are a greater risk than youth nationwide of developing chronic diseases such as CVD due to unhealthy behavior.

A higher percentage of Kentucky youth smoke than youth nationwide. In fact, more youth in Kentucky smoke than do adults. Our young people are more likely to smoke, more likely to initiate smoking before age 13 and are more likely to be frequent smokers than youth nationwide.

Table 5 Youth Tobacco Use		
	Kentucky	**Nation**
Smoked < age 13	33%	25%
Current Smoker	47%	37%
Frequent Smoker	28%	17%

Kentucky youth are also less physically active than their counterparts in the rest of the nation. Only 60 of youth engage in vigorous physical activity on a regular basis while only 18% engage in moderate physical activity.

Nationally, the percentage of children and adolescents who are overweight has more than doubled in the past 30 years, with most of this increase occurring since the late 1970's. Evidence shows that overweight children and adolescents are more likely to become overweight adults. Youth are also beginning to exhibit other health problems such as elevated blood cholesterol and high blood pressure. In Kentucky, doctors are beginning to see youth with "adult" diabetes, a disease known to be linked to obesity. It is vital to understand that our children are experiencing the physiological changes NOW, which lead to chronic disease and death due to chronic diseases later in life. For example, autopsy studies have shown that early signs of hardening of the arteries (atherosclerosis), the most common cause of CVD, can be seen in children.

Various studies have shown that children and adolescents are familiar with general knowledge of the relationship between nutrition and health, but have little knowledge of the healthfulness of specific foods. For example, youth understand the importance of a low fat, low cholesterol, higher fiber diet, but do not know which foods meet those requirements.

CONCLUSIONS

This report provides an initial picture of cardiovascular health in Kentucky. That picture includes higher mortality rates than most of the rest of the country. Almost half of all hospital charges in the state relate to cardiovascular disease. More than 60% of the population have multiple risk factors for cardiovascular disease. We have the highest smoking rates in the country among adults and youth. Blacks and women bear a disproportionate share of the burden, as do certain geographic regions.

Just as public health advocates faced many societal level barriers in combating infectious diseases, new societal level barriers have developed, blocking the way to progress in battling cardiovascular and other chronic diseases. CDC has stated that it "considers it a priority that individuals be afforded opportunities to pursue and maintain good health through such avenues as safe walking and cycling trails: low-fat, high fruit and vegetable menu selections in restaurants, schools and worksite cafeterias and physical activity programs in schools, worksites and community gathering places".

As we move forward, we may find ourselves identifying public health consequences in areas previously considered outside the pubic health arena. For example, decisions about where and how to construct new roads, schools, shopping areas and can affect pedestrian and bicycle usage, two modes of moderate physical activity. New housing built without sidewalks discourages walking. Widening of roads can result in increased and faster traffic flows and decreased walking or biking.

Youth comprise an important at risk group which must be targeted for aggressive prevention interventions. Schools are a crucial part of the social environment that shape the health behaviors of youth, but school based programs alone can not succeed in producing major cultural shifts. The knowledge, attitudes and skills introduced in schools must be reinforced throughout other sectors of society.

The first step in any planning process is analysis of data to define the nature and scope of the problem. There is a significant amount of data already available to describe the current status of cardiovascular health in Kentucky. This report is one small step in beginning to determine where we want to be in the future and how we get there.

Successfully changing the status of cardiovascular disease in Kentucky will require a plan which includes population based prevention approaches which extend across a number of socially distinct groups and which reach high-risk populations. The success of such a plan will depend largely on the ability of public, private, professional and voluntary organizations to collaborate effectively in planning, implementing and evaluating their efforts toward prevention.